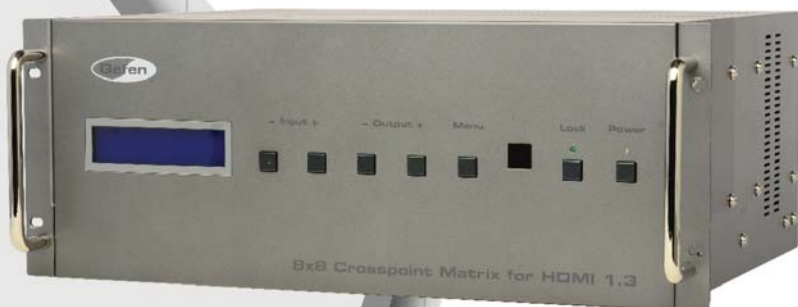


# Gefen

®

## 8x8 Crosspoint Matrix for HDMI® 1.3

EXT-HDMI1.3-848CPN  
User Manual



[www.gefen.com](http://www.gefen.com)

## ASKING FOR ASSISTANCE

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**Rev A5**

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# INTRODUCTION

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Congratulations on your purchase of the Gefen 8x8 Crosspoint Matrix for HDMI 1.3. Your complete satisfaction is very important to us.

## **Gefen**

Gefen delivers innovative, progressive computer and electronics add-on solutions that harness integration, extension, distribution and conversion technologies. Gefen's reliable, plug-and-play products supplement cross-platform computer systems, professional audio/video environments and HDTV systems of all sizes with hard-working solutions that are easy to implement and simple to operate.

## **The Gefen 8x8 Crosspoint Matrix for HDMI 1.3**

The Gefen 8x8 Crosspoint Matrix for HDMI 1.3 routes high definition video at resolutions of up to 1080p with multichannel digital audio from any eight HDMI sources to any eight displays. The 8x8 Crosspoint Matrix supports advanced digital audio formats such as Dolby True HD and DTS-HD Master audio. Each source is accessible at all times by any display by selecting it with the included IR remote, by using the RS-232 port or by using the button switches on the front panel.

## **How It Works**

Connect up to eight Hi Def sources to the Gefen 8x8 Crosspoint Matrix for HDMI 1.3 using the supplied HDMI cables. Connect up to eight HDTV displays to the Matrix's HDMI outputs. 3D content can be displayed when connecting a 3DTV and 3D source. Power-on the Matrix and apply power to the sources and to the displays. A/V sources can now be routed to any combination of display devices using the front panel buttons, the included IR remote control or RS-232 control.

## OPERATION NOTES

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### **READ THESE NOTES BEFORE INSTALLING OR OPERATING THE GEFEN 8X8 CROSSPOINT MATRIX FOR HDMI 1.3**

- There is no internal scaling in the Gefen 8x8 Crosspoint Matrix for HDMI 1.3. All of the attached monitors must be able to display the resolutions output by the source devices. For maximum compatibility it is recommended that only one compatible / common resolution be used by all of the source devices.
- The Gefen 8x8 Crosspoint Matrix for HDMI 1.3 is a full-featured crosspoint matrix for eight inputs and eight outputs. Any source can be connected to any display at any time, using the remote control or by controlling it via the buttons on the front panel.
- 3D content pass-thru is enabled to all outputs when a 3DTV is connected to Output A. Ensure to power cycle the Matrix once a 3DTV is connected to Output A during standard operation.

# FEATURES

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## Supported HDMI 1.3 Features

- 225 MHz (up to 12-bit YUV 444 @ 1080p)
- Deep Color
- Dolby TrueHD and DTS-HD Master Audio
- Lip-Sync

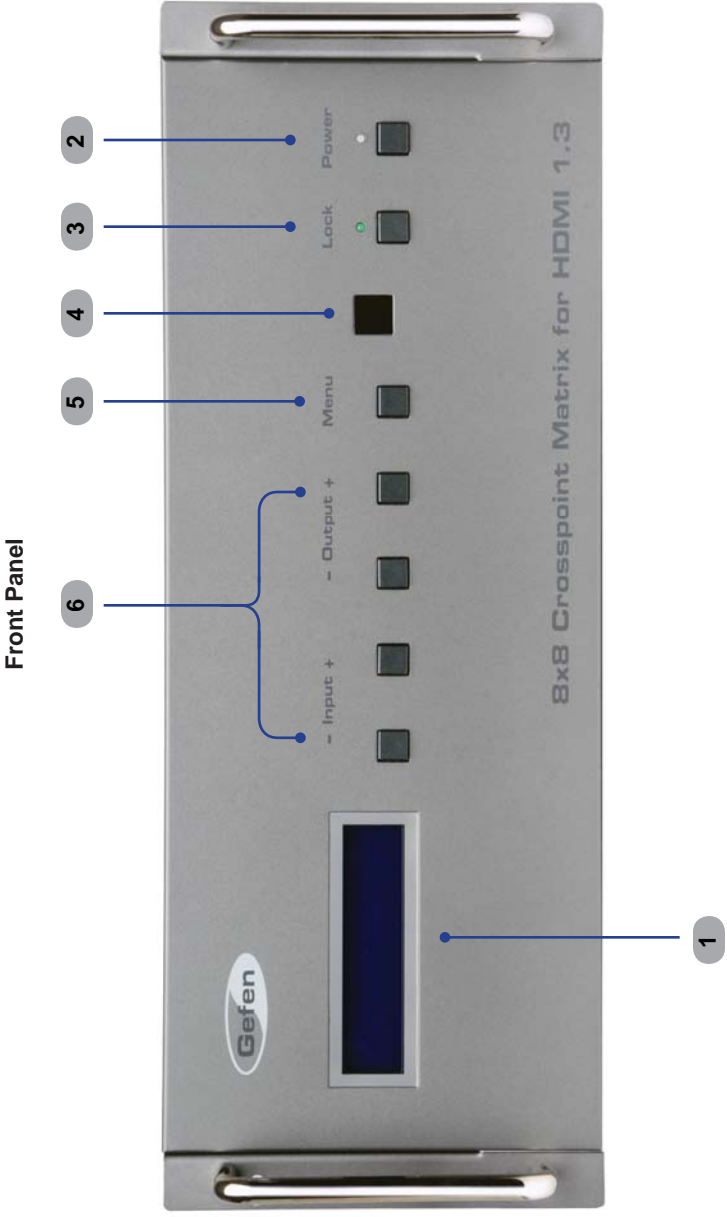
## Features

- Displays any of eight (8) Hi Def sources on eight (8) HDTV displays, independently
- Maintains beautiful, sharp HDTV resolutions up to 1080p Full HD and 2K
- 3DTV Pass-Through
- EDID Management for rapid integration of sources and display devices.
- Fast Switching for quick and responsive HDMI signal routing.
- Supports digital audio formats including LPCM 7.1 audio, Dolby Digital Plus, Dolby TrueHD, and DTS-HD Master Audio
- IR Control
- Built-in IR Extender
- RS-232 serial control
- Locking HDMI Connectors
- Rack-mountable
- HDCP-compliant

## Package Includes

- (1) Gefen 8x8 Crosspoint Matrix for HDMI 1.3
- (8) 6 ft HDMI cables (M-M)
- (1) 6 ft DB9 Serial Cable (M-F)
- (1) IR Remote Control Unit
- (1) 24V DC Power Supply
- (1) Rack Ears
- (1) User Manual

# FRONT PANEL LAYOUT



## FRONT PANEL DESCRIPTIONS

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### **1 Main LCD Display**

This is a two-line, sixteen-character display which displays status information and is also used to manage display / source routing.

### **2 Power On/Off Button**

Turn the power on or off using this button (the LED will change color from red to green).

### **3 Lock Button**

Temporarily locks the front panel controls. This prevents inadvertent routing changes or power-down. The LED above the button is turns bright green when the front panel is locked. Press once to lock the front panel buttons. Press this button again to unlock the front panel buttons.

### **4 IR Sensor**

Receives signals from the IR Remote Control.

### **5 Menu Button**

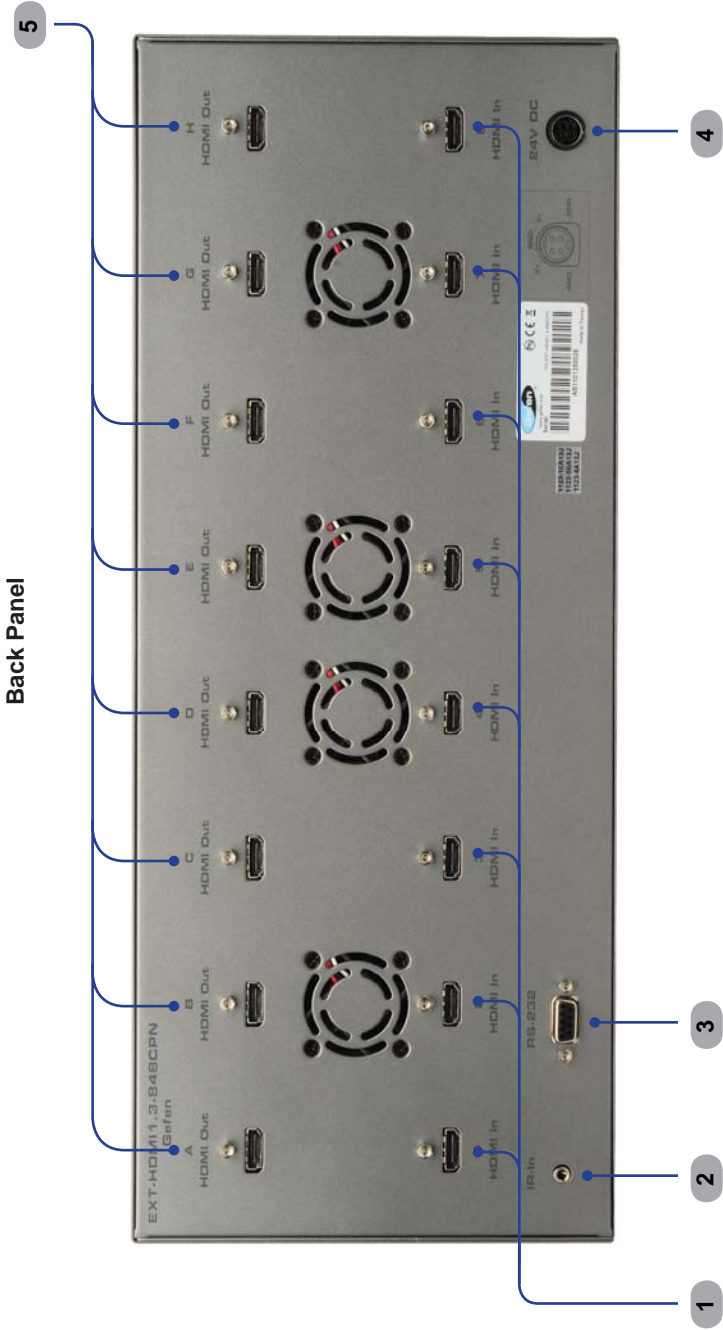
Pressing this button changes between routing mode and status mode.

### **6 Navigation Buttons**

These buttons are used to navigate between the inputs and outputs of the Gefen 8x8 Crosspoint Matrix for HDMI 1.3. For details on how these controls are used, see page 9.



# BACK PANEL LAYOUT



## BACK PANEL DESCRIPTIONS

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- 1 HDMI Input Ports (1 – 8)**  
Connect a Hi-Def source device to any of these input ports.
- 2 IR Extender Port**  
Used to extend the IR Sensor range of the unit.
- 3 RS-232 Serial Port**  
Connects to the RS-232 control device. The 8x8 Crosspoint Matrix for HDMI 1.3 may be switched remotely using this port. See page 15 for more information.
- 4 24V DC Power Receptacle**  
Connect the included 24V Power Supply to this receptacle.
- 5 HDMI Output Ports (A – H)**  
Connect HDTV displays to these HDMI ports.

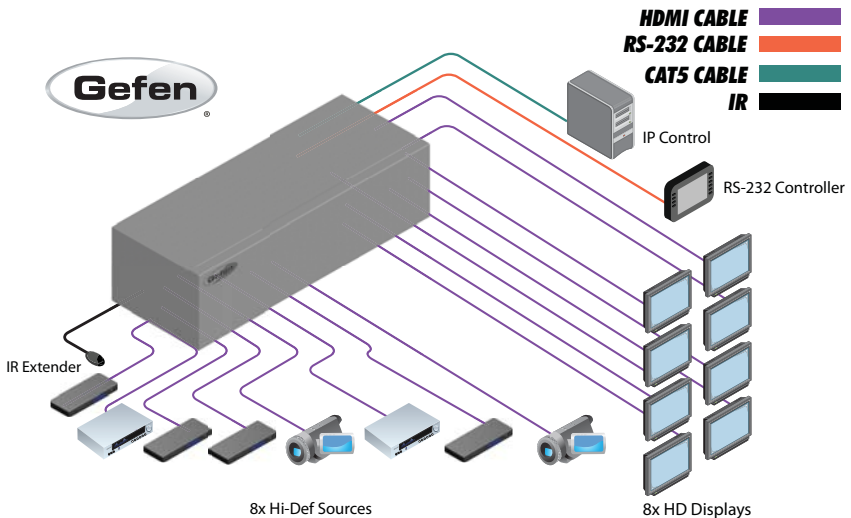
# CONNECTING THE 8X8 CROSSPOINT MATRIX FOR HDMI 1.3

## How To Connect The 8x8 Crosspoint Matrix For HDMI 1.3

1. Using the supplied HDMI cables, connect a Hi Def source to HDMI Input 1 on the 8x8 Crosspoint Matrix. Connect a second Hi Def source to HDMI Input 2, and so on.
2. Connect an HDTV display to HDMI Output A on the 8x8 Crosspoint Matrix. Connect another HDTV display to HDMI Output B, and so on.
3. Connect the included 24V DC power supply to the 8x8 Crosspoint Matrix and plug the power cord into an available wall outlet.
4. The power button LED will turn bright red indicating that the 8x8 Crosspoint Matrix is in standby mode.
5. Power on the displays and the source devices. Turn on the 8x8 Crosspoint Matrix for HDMI 1.3 by pressing the power button on the front panel. A vibrant HDTV HD picture should be seen, along with multichannel digital audio (if the display supports audio).

**NOTE:** If the source and display support 3D then the 8x8 Crosspoint Matrix for HDMI 1.3 will pass through the 3D signal. Output A must be connected to a 3DTV.

## Wiring Diagram for the 8x8 Crosspoint Matrix for HDMI 1.3



**EXT-HDMI1.3-848CPN**

# CONTROLLING THE MATRIX USING THE FRONT PANEL BUTTONS

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## How to Switch between Inputs and Outputs

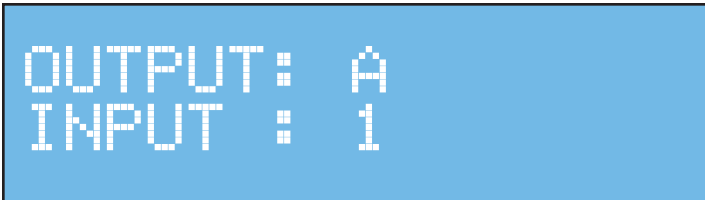
The main display of the Gefen 8x8 Crosspoint Matrix for HDMI 1.3 is a sixteen-character, two-line LCD. This display shows the current routing status



The first row represents outputs A through H on the back of the unit. The second row represents the inputs to which each output is routed. Each input can have a value from 1 to 8.

### Routing sources to a display

- 1 Press the **Output+** button. The display will change to show a single output (zone) and input (source).



- 2 Press the **Input+ or Input-** button to change the input (source).
- 3 Press the **Output+ or Output-** button to cycle through each of the outputs (zones).

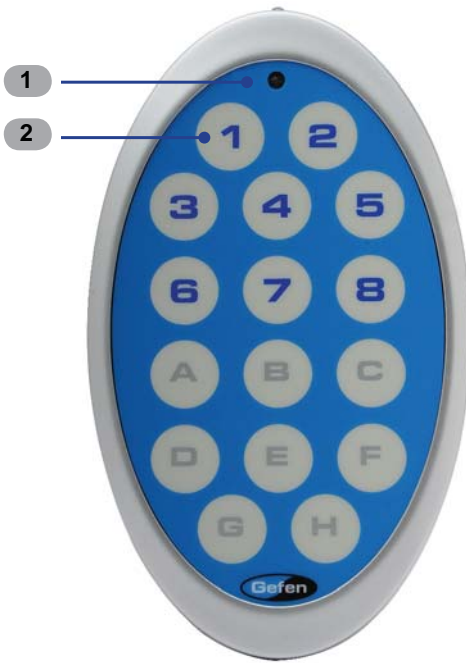


- 4 Press the **Menu** button to return to the routing status screen.

## IR REMOTE DESCRIPTION

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RMT-848IR Remote



- 1**     ***LED Button Press Indicator***  
This LED will be activated momentarily each time a button is pressed.
  
- 2**     ***Display and Source Selection Buttons***  
These buttons are used to select which input source is routed to the HDTV display.

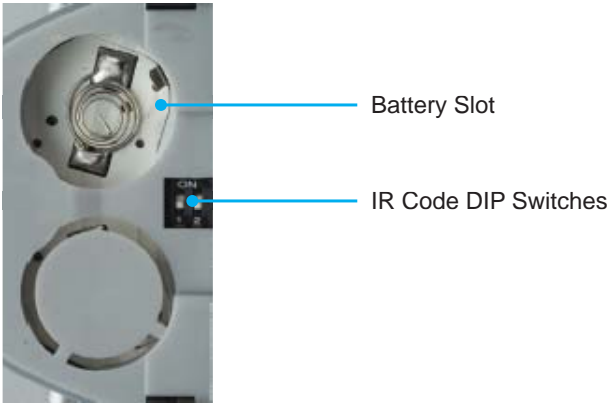
# IR REMOTE INSTALLATION

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## Installing the RMT-848IR Battery

1. Remove the battery cover on the back of the remote.
2. Insert the included battery into the open battery slot. The positive (+) side of the battery should be facing up.
3. Replace the battery cover.

The remote ships with two batteries. One battery is required for operation and the other battery is a spare.

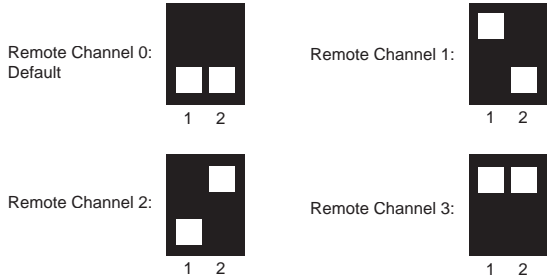


# IR REMOTE CONFIGURATION

## How to Resolve IR Code Conflicts

In the event that IR commands from other remote controls interfere with the supplied IR remote, changing the remote IR channel will fix the problem. The IR remote control has a bank of DIP switches used for setting the remote IR channel.

The DIP switch bank on the IR remote is located underneath the battery cover.



**Left:** Picture of the opened rear battery compartment of the IR remote showing the exposed DIP Switch bank between the battery chambers.

It is important that the remote IR channel selected on the remote, matches the IR channel set on the Gefen 8x8 Crosspoint Matrix for HDMI 1.3. For example, if both DIP switches on the IR remote are set to IR channel 0 (toward the “1” and “2”), the Gefen 8x8 Crosspoint Matrix for HDMI 1.3 must be set to use IR channel 0.

See page 14 on how to change the IR channel on the Gefen 8x8 Crosspoint Matrix for HDMI 1.3.

## USING THE IR REMOTE

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The IR remote control will allow the user to select which source will be routed to which output. Each of the two (2) outputs are assigned a group of four buttons which correspond to the four source inputs. Please use the information below when selecting the desired source for each display.

**Table of IR Remote Commands  
for the Gefen 8x8 Crosspoint Matrix for HDMI 1.3**

Source	Display
1	A
2	B
3	C
4	D
5	E
6	F
7	G
8	H

### Routing Sources to Displays

Buttons 1 through 8 on the IR remote correspond to each HDMI input on the Matrix. Buttons A through H correspond to each HDMI output. To route a source to a display, press the desired input on the IR remote then press the desired output.

Example:

*Route the source connected to Input 6 to Display D.*

- 1 Press and release button 6 on the IR remote.
- 2 Press and release button D.

The image shown on Display 4 will be the Hi-Def source connected to HDMI In 6 on the Gefen 8x8 Crosspoint Matrix for HDMI 1.3. The number six will be displayed under the letter D in the front panel display, indicating that Input 6 has been routed to Display D.



## SETTING THE IR CHANNEL ON THE MATRIX



1. Press the **Input -**, **Input +** and **Output -** buttons simultaneously.
2. The Main LCD Display will show the following



Use the **Input +** and **Input -** buttons to switch between OFF and ON states. Use the table below to set the correct IR channel.

It is important that the IR setting that is selected match the DIP switch settings on the IR remote. For example, if both DIP switches on the IR remote are set to the down position (channel 0), the IR channel for the Matrix must be set to IR channel 0 ("IR Address : 0, 1-OFF, 2-OFF").

IR ADDRESS	REMOTE SW1	REMOTE SW2
0	OFF	OFF
1	ON	OFF
2	OFF	ON
3	ON	ON

Once the correct IR channel has been set, press the **Menu** button.

# RS-232 SERIAL INTERFACE



Only Pins 2 (RX), 3 (TX), and 5 (Ground) are used on the RS-232 serial interface

This feature allows for easy integration into automated systems capable of transmitting RS-232 commands. Use the settings below to configure the RS-232 port of the user's system.

Transmitting the appropriate numeric ASCII character will simulate key-presses on the IR remote control.

Binary Table

ASCII	Corresponding RMT-848IR Button	Binary	ASCII	Corresponding RMT-848IR Button	Binary
1	1	0011 0001	A	A	0110 1001
2	2	0011 0010	B	B	0110 0001
3	3	0011 0011	C	C	0110 0010
4	4	0011 0100	D	D	0110 0011
5	5	0011 0101	E	E	0110 0100
6	6	0011 0110	F	F	0110 0101
7	7	0011 0111	G	G	0110 0110
8	8	0011 1000	H	H	0110 0111

## RS-232 Settings

Bits per second .....19200

Data bits ..... 8

Parity ..... None

Stop bits .....1

Flow Control ..... None

## RS-232 COMMANDS

---

Simplified syntax was used for command implementation for faster operation with the device. RS-232 commands are not case-sensitive.

### Commands

Command	Description
<i>A</i>	Routes the specified Input to Output A
<i>B</i>	Routes the specified Input to Output B
<i>C</i>	Routes the specified Input to Output C
<i>D</i>	Routes the specified Input to Output D
<i>E</i>	Routes the specified Input to Output E
<i>F</i>	Routes the specified Input to Output F
<i>G</i>	Routes the specified Input to Output G
<i>H</i>	Routes the specified Input to Output H
<i>ABCD....</i>	Routes the specified Input to any combination of Outputs
<i>L</i>	Sets the specified Input to use Slow Switching
<i>M</i>	Displays the current Matrix status
<i>Q</i>	Sets the specified Input to use Fast Switching
<i>RS</i>	Reset Matrix to factory settings
<i>X</i>	Power-OFF the Matrix
<i>Y</i>	Power-ON the Matrix
<i>Z0</i>	Enable 10-bit Deep Color Support
<i>Z1</i>	Enable 12-bit Deep Color Support

## A Command

Routes the specified Input to Output A.

### Syntax:

A[no space]param1

### Parameters:

<i>param1</i>	HDMI Input (Source)	[1 - 8]
---------------	---------------------	---------

### Example:

A5 routes Input 5 to Output A.

### Notes:

Individual routing to other outputs (B - H) can be accomplished by using a similar syntax and substituting the A with the range B through H. For example, to route Input 7 to Output E, use the following command:

E[no space]7

See the table on page 16 for details.

## ABCD... Multiple Routing Command

Route the specified source to any combination of Outputs.

### Syntax:

param1[param1a][param1b][param1c]...param2

### Parameters:

<i>param1</i>	HDMI Output (Display)	[A - H]
<i>param2</i>	HDMI Input (Source)	[1 - 8]

### Example:

ABFGH6 routes Input 6 to Outputs A, B, F, G, and H.

### Notes:

Only one source (input) can be specified at a time.

### L Command

Sets the specified Input to use Slow Switching.

Syntax:

L[no space]param1

Parameters:

*param1*                      HDMI Input (Source)              [1 - 8]

### M Command

Returns the current routing status of the matrix in addition to the firmware version.

Syntax:

m

Parameters:

None

### Q Command

Sets the specified Input to use Fast Switching.

Syntax:

Q[no space]param1

Parameters:

*param1*                      HDMI Input (Source)              [1 - 8]

### RS Command

Reset the matrix to the default routing status (A=1, B=2, C=3, D=4, E=5, F=6, G=7, H=8). The IR address will be set to 0.

Syntax:

rs

Parameters:

None

### ST Command

The ST command displays the current routing state and the current firmware version of firmware.

Syntax:

st

Parameters:

None

### X Command

The X command turns off the Gefen 8x8 Crosspoint Matrix for HDMI 1.3.

Syntax:

x

Parameters:

None

### Y Command

The Y command powers on the Gefen 8x8 Crosspoint Matrix for HDMI 1.3.

Syntax:

*y*

Parameters:

*None*

### Z0 Command

Modifies the EDID and forces 10-bit Deep Color.

Syntax:

*z0*

Parameters:

*None*

### Z1 Command

Modifies the EDID and forces 12-bit Deep Color.

Syntax:

*z1*

Parameters:

*None*



## Fast Switching Technology

Fast Switching Technology (FST) is a Gefen software implementation for HDMI 1.3 products. FST was created to improve the lengthy HDMI authentication process, based on the HDMI and HDCP specifications.

FST provides quicker A/V source switching and greatly improves the overall A/V system behavior and performance when more than one HDTV display is used in the system setup.

FST allows connecting / disconnecting or turning ON / OFF of HDTV displays without having these activities affect other Hi-Def sources routed to any other HDTV display in the same system.

### **FAST MODE:**

Setting the Matrix to FAST mode will improve performance when connecting / disconnecting Hi-Def sources, and powering ON / OFF HDTV displays.

**NOTE:** When switching from SLOW mode to FAST mode, the HDTV displays connected to the Matrix will blink momentarily.

### **SLOW MODE:**

When set to SLOW mode, the Matrix will follow the standard authentication process, based on the HDMI and HDCP specifications. SLOW mode is recommended when the source does not support multiple devices.



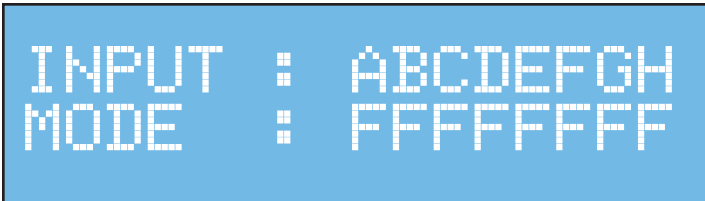
# FAST SWITCHING

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## Changing between Fast Switching and Slow Switching Modes

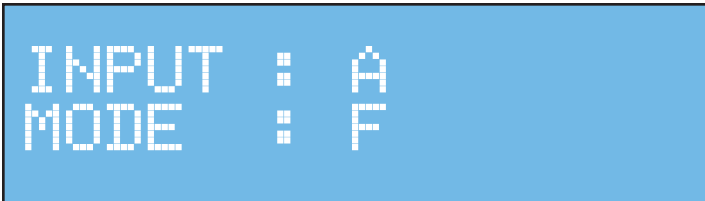
Each HDMI input can be set to use either Fast Switching or Slow Switching. Fast Switching should be used for the best performance.

1. Press the **Menu** button on the front panel.



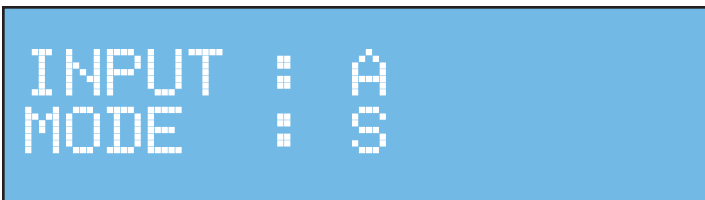
The switching mode for each input will be displayed under each output. The letter **F** indicates that the HDMI input is using Fast Switching. If the HDMI input is set to Slow Switching, a letter **S** will be displayed.

2. Press the **Output+** button on the front panel.



The screen will display one output and one input. The switching mode for the input can now be changed.

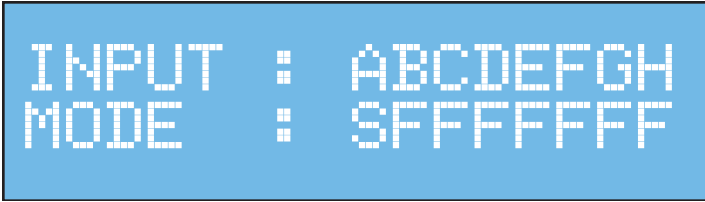
3. Use the **Input +** and **Input -** button to change between Fast Switching mode and Slow Switching mode. In the illustration below, HDMI input 1 is set to Slow Switching.



## FAST SWITCHING

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4. Once the switching mode has been set, press the **Menu** button to accept the changes.



The front panel shows which inputs are set to Slow Switching and which inputs are set to Fast Switching.

Press the **Menu** button again to return to the routing status screen.

# EDID MANAGEMENT

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## External EDID Management

The 8x8 Crosspoint Matrix for HDMI 1.3 features EDID Management. Before the source can send video or audio signals, the source device reads the EDID (Extended Display Identification Data) from the output devices connected to the Splitter. The EDID contains information about what type of A/V data that the source can send to each output device.

The 8x8 Crosspoint Matrix for HDMI 1.3 routes multiple sources to multiple output devices. This involves reading EDID data from more than one device. Management of the EDID data is important to maintain compatibility between all devices.

### **The following EDID features are copied from Output A:**

- Supported Resolutions
- 3D Support
- Audio Features

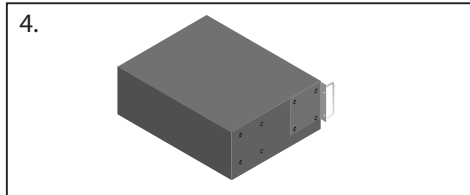
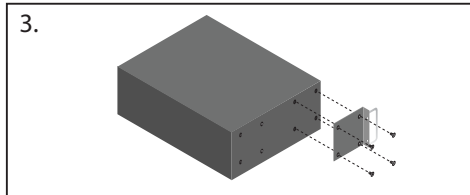
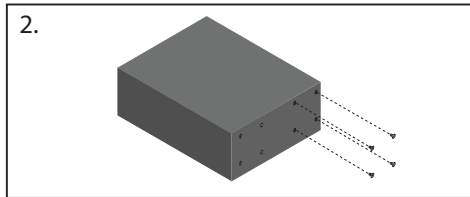
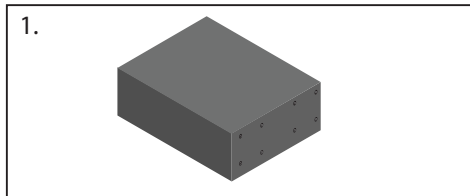
### **Display Connections:**

- If a device is not connected to Output A, then no EDID changes are made, meaning that the previous EDID information will be used. This state will be in effect until a display is connected to Output A and the Matrix is power-cycled.
- EDID is built from Output A to the Input. The audio block will be copied from Output A. EDID-copying is performed only when the Matrix is reset or power-cycled.

## RACK MOUNT INSTALLATION

Rack mount ears are provided for installing the Matrix in a 5U rack space. To mount the Matrix in the rack, do the following:

1. Locate the 4 side screws on each side of the Matrix.
2. Remove these screws (located closest to the front of the Matrix).
3. Using the 4 removed screws, secure each rack ear plate onto the side of the Matrix with the handle facing the front side of the Matrix.
4. Repeat the procedure on the opposite side of the Matrix.
5. With the front panel facing you, firmly grip both rack mounting handles and insert the Matrix into the rack. Slide the Matrix into the rack, pushing firmly until the Matrix will not travel any further. Secure the Matrix into the rack using the four supplied rack mounting screws .



## SPECIFICATIONS

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Video Amplifier Bandwidth .....	225 MHz
Single Link Range.....	1080p / 1920x1200
Input Video Signal.....	1.2 V p-p
Input DDC Signal.....	5 V p-p (TTL)
RS-232 Interface.....	DB-9 (M)
Input Connectors.....	(8) HDMI Type-A, 19-pin (M)
Output Connectors.....	(8) HDMI Type-A, 19-pin (M)
Power Supply.....	24V DC
Power Consumption.....	.85 W (max.)
Dimensions.....	19.0" W x 7.0" H x 13.375" D
Rack mountable.....	5U rack space
Shipping Weight.....	24.7 lbs

## WARRANTY

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Gefen warrants the equipment it manufactures to be free from defects in material and workmanship.

If equipment fails because of such defects and Gefen is notified within two (2) years from the date of shipment, Gefen will, at its option, repair or replace the equipment, provided that the equipment has not been subjected to mechanical, electrical, or other abuse or modifications. Equipment that fails under conditions other than those covered will be repaired at the current price of parts and labor in effect at the time of repair. Such repairs are warranted for ninety (90) days from the day of reshipment to the Buyer.

This warranty is in lieu of all other warranties expressed or implied, including without limitation, any implied warranty or merchantability or fitness for any particular purpose, all of which are expressly disclaimed.

1. Proof of sale may be required in order to claim warranty.
2. Customers outside the US are responsible for shipping charges to and from Gefen.
3. Copper cables are limited to a 30 day warranty and cables must be in their original condition.

The information in this manual has been carefully checked and is believed to be accurate. However, Gefen assumes no responsibility for any inaccuracies that may be contained in this manual. In no event will Gefen be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect or omission in this manual, even if advised of the possibility of such damages. The technical information contained herein regarding the features and specifications is subject to change without notice.

For the latest warranty coverage information, refer to the Warranty and Return Policy under the Support section of the Gefen Web site at [www.gefen.com](http://www.gefen.com).

## PRODUCT REGISTRATION

**Please register your product online by visiting the Register Product page under the Support section of the Gefen Web site.**



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This product uses UL listed power supplies.